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EXAMINER

JEFFERY, JOHN A

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 12

Application Number: 09/768,885
Filing Date: January 23, 2001
Appellant(s): MORELAND ET AL.

Cynthia S. Murphy
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3/4/02.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The amendment after final rejection filed on 3/4/02 has been entered.

(5) *Summary of Invention*

The summary of invention contained in the brief is correct.

(6) *Issues*

The appellant's statement of the issues in the brief is correct.

(7) *Grouping of Claims*

The appellant's statement in the brief that certain claims do not stand or fall together is not agreed with because there is no independent reason given why issue C should not stand or fall together with Issue A.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

2,643,320	Pfenninger, Jr.	6-1953
1,142,393	Bloomer	6-1915
JP2000-106268	Japan	4-2000
2,599,059	Jones	6-1952

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 13, 14, and 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfenninger, Jr. in view of Bloomer. This rejection is set forth in prior Office Action, Paper No. 6.

Claims 15 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfenninger, Jr. in view of Bloomer and further in view of JP2000-106268. This rejection is set forth in prior Office Action, Paper No. 6.

Claims 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pfenninger, Jr. in view of Bloomer and further in view of Jones. This rejection is set forth in prior Office Action, Paper No. 6.

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(11) Response to Argument

In view of Bloom, it would have been obvious to one of ordinary skill in the art to stitch the electric heater wire in Pfenninger.

The base reference to Pfenninger, Jr. ("Pfenninger") discloses an electrically heated thin pad (col. 1, line 31) adapted to be used for deicing an airplane. (Col. 1, lines 36-37.) The pad is heated via an electric heating element 13 which is wound through openings along the "heater layer" 12.

However, Pfenninger does not disclose stitching the electric heating element to the underlying substrate. Accordingly, the examiner in the final rejection relied on the Bloomer reference to show that stitching an electric heating element would have been obvious to one of ordinary skill in the art. As is well known in the art, the requisite benefits of stitching an electric heater as compared with other heated pad heating element attachment methods include, *inter alia*, (1) providing more heater wire per unit surface area of the heating pad, (2) facilitating heating element attachment via automated techniques such as programmable sewing machines, and (3) reducing the amount of time required in attaching the heating element.

On Page 1, lines 33-38, Bloomer states:

[I]t is apparent that the resistance conductor so attached to the body of the pad will be quickly affixed thereto with a maximum amount of surface or length of conductor in proportion to a minimum space. (emphasis added.)

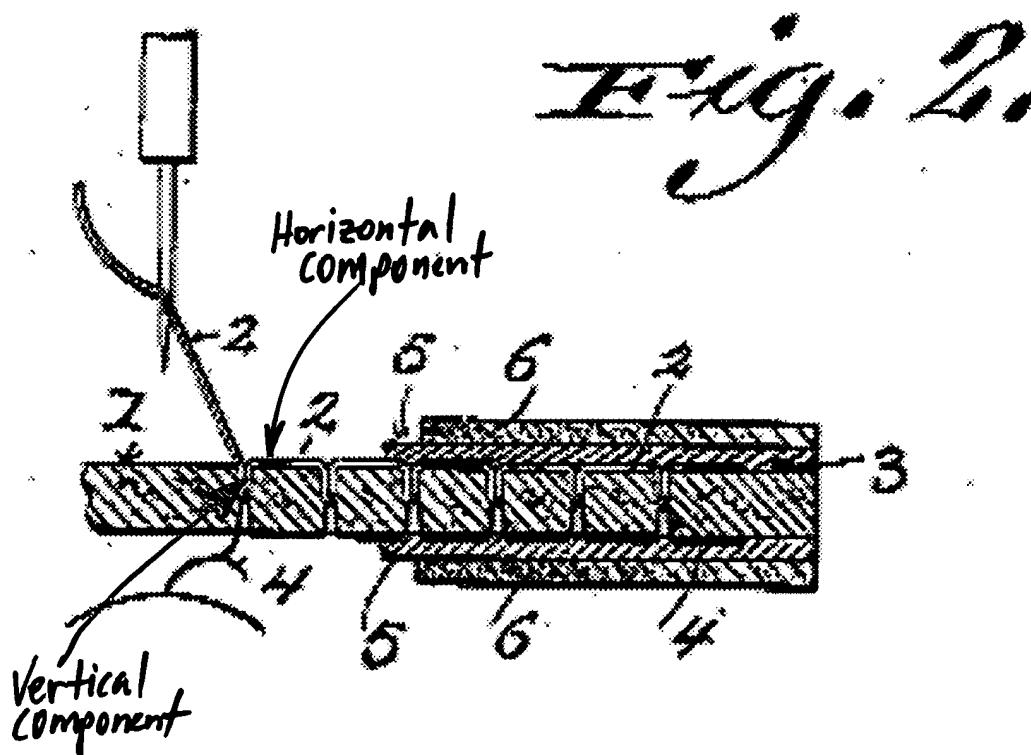
Furthermore, Bloomer on Page 1, lines 97-107 notes:

...[B]y employing the strand as a sewing element...[the pad's] utility and lasting qualities are proportionately greater, due to the fact that in stitching the strand a greater number of feet of resistance conductor in a given length is

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obtained than in such pads wherein the conductor is laid thereon and secured in an ordinary manner. (emphasis added.)

Stitching a heater pattern involves not only configuring the heater wire in the plane of the underlying substrate, but also transverse to the plane of the underlying substrate. This is best seen in Fig. 2 of Bloomer.



As shown, the heater wire not only has a horizontal component that is parallel to the plane of the substrate surface, but the wire also has a vertical component in a direction transverse to the substrate surface resulting from the stitching process.

It is the combination of vertical and horizontal components of the heater wire itself which gives rise to the increased heater wire per unit area of the substrate. That is, for a given surface area, a stitched heater mounting, with its requisite horizontal and vertical heater path components necessarily requires more wire per unit area than a

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heater securement utilizing only a substantial horizontal component. This distinction was implied by Bloomer in the second quoted passage above.

Therefore, if the heating element of Pfenninger were stitched to the underlying substrate as suggested by Bloomer, one would have a heater that not only was securely mounted, but also which would provide more heat per unit surface area as noted above.

Furthermore, Bloomer also expressly states on Page 1, lines 22-24 that a stitched heating element pattern can be formed via sewing machines. Moreover, by sewing the heating element, "the pad can be cheaply manufactured with great speed." (Bloomer, P. 1, lines 99-100.) As is well known in the art, attaching an electric heating element via sewing has numerous advantages over other attachment techniques including, *inter alia*, (1) enabling precise control over the heating element pattern via automated sewing machines, (2) providing a faster and more efficient attachment process, and (3) the ability to obtain a wide variety of different geometric heating element patterns merely by selecting pre-programmed stitching patterns. Such ease and flexibility in changing the overall heating element pattern via the selection of a desired stitching pattern would simply not be possible with a wound heating element such as that shown by Pfenninger.

Moreover, the ability to easily change the heating element pattern geometry enables the manufacture of custom-tailored heating pads specially adapted for a particular heating application. For example, more heat may be needed nearer to the outer periphery of the pad than the center. Accordingly, an appropriate heating element stitching pattern could then be selected which would localize more heat adjacent the

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periphery. Conversely, another heating application might demand more heat localized near the center of the pad. The appropriate geometric pattern could then be selected to meet this need.

Appellant nevertheless argues that despite the advantages noted by Bloomer, it would not be obvious to sew the heating element of Pfenninger to the underlying substrate because the purpose of a deicer panel is not to heat an entire airfoil structure, but rather to remove ice from its accumulated surface. (Brief, Page 9, second full paragraph.) Appellant contends that heating spaces vertically below the breezside surface of the heater layer purportedly "robs the deicing system of heating energy for melting ice." Appellant then concludes there would be no reason to stitch the element since "vertical components" would not purportedly increase the deicing heat per unit surface area.

The examiner respectfully disagrees. By stitching the electric heating wire to the underlying substrate, there is necessarily more heat per unit surface area along the pad irregardless of the intended use of the pad.

Moreover, by stitching the element, there is necessarily more heat generated on both sides of the pad--not just below the pad as Appellant suggests. While the vertical component of the heating wire extends a direction towards the center of the underlying substrate 1 as best seen in Fig. 2 of Bloomer, there is nevertheless a considerable increase in heat on both sides of the pad due to (1) the increased amount of heating wire used for the heating element pattern, and (2) conduction of the heat generated by the wire through the intervening layers on both sides of the heating wire ultimately to

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both sides of the pad. Therefore, when mounted on an aircraft structure, not only would a stitched pad increase heat to the underlying aircraft structure to which it was mounted (i.e., below the pad), but also provide increased heat to the outer surface of the pad and consequently any ice forming thereon.

The JP2000-106268 reference teaches a programmable sewing machine to automatically stitch the heating pattern.

Appellant alleges on Page 10 of the Brief that JP2000-106268 ("JP '268") "offers absolutely no suggestion that a sewing machine should or could be programmed to automatically switch a heat dissipating pattern for an aircraft deicer panel."

As noted in the final rejection, the JP '268 reference suggests providing an automatic sewing machine which is capable of controlling the stitch pattern of an electric heater wire via a control circuit. While JP '268 does not teach explicitly using the disclosed sewing technique in the narrow application of aircraft deicer panels, the reference clearly teaches sewing an electric heating element wire to an underlying substrate in a variety of patterns using an automatically controlled sewing machine. Thus, because the reference is in the same field of endeavor as that of the instant invention--electric heating--there is sufficient nexus to combine the teachings of JP '268 to the Pfenninger and Bloomer combination.

Moreover, since Bloomer expressly states the electric heating wire can be sewn with a sewing machine, one of ordinary skill in the art would indeed be motivated to turn to the teachings of JP '268 which also teaches sewing an electric heating wire to an

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underlying substrate with a sewing machine. Moreover, because the JP '268 sewing machine is automatically controlled and enables stitching of the heating element in various patterns, the flexibility of selecting a desired stitching pattern to achieve a desired heating pattern as noted previously would be readily apparent to one of ordinary skill in the art.

Moreover, the Examiner recognizes that references cannot be arbitrarily combined and that there must be some reason why one skilled in the art would be motivated to make the proposed combination of primary and secondary references. *In re Nomiya*, 184 USPQ 607 (CCPA 1975). However, there is no requirement that a motivation to make the modification be expressly articulated. The test for combining references is what the combination of disclosures taken as whole would suggest to one of ordinary skill in the art. *In re McLaughlin*, 170 USPQ 209 (CCPA 1971). References are evaluated by what they suggest to one versed in the art, rather than by their specific disclosures. *In re Bozek*, 163 USPQ 545 (CCPA 1969). In this case, because the JP '268 reference clearly suggests the advantages of using an automatically controlled sewing machine to sew an electric heating wire to an underlying substrate, there is sufficient motivation to combine the teachings of JP '268 with the Pfenninger/Blommer references.

Cementing an electrically heated deicer panel to the wing of an aircraft would have been obvious to one of ordinary skill in the art in view of Jones.

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Since no additional arguments were raised in connection with Issue C of the Brief, the examiner reiterates his position from the final rejection that cementing an electrically heated deicer panel to the wing of an aircraft would have been obvious to one of ordinary skill in the art in view of Jones. Rather than repeat the text of that position, the examiner's position from Page 3 of the final rejection in connection with claims 29-32 is hereby incorporated by reference.


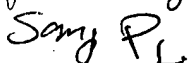
For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,



John A. Jeffery
Primary Examiner
Art Unit 3742

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May 17, 2002

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